
वस्त्रादि फर्श आवरण — लैंडस्केप के लिए
कृत्रिम धागे से बनी हुई बनावटी घास की
कालीन — विशिष्टि

**Textile Floor Covering — Artificial
Grass Carpet made of Synthetic Yarn
for Landscape — Specification**

ICS 59.080.60

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FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Wool, Wool Products and Textiles Floor Coverings Sectional Committee had been approved by the Textiles Division Council.

Artificial grass is a surface of synthetic fibers made to look like natural grass. It is most often used in residential lawns, outdoor places and commercial applications as well. The popularity of Artificial grass is rising due to its several benefits over natural grass as it requires no irrigation or trimming, low maintenance, and this can withstand all weather conditions. These artificial grass carpet also stays green and closely resemble a real lawn. Artificial grass is subjected to UV exposure for long duration, hence the requirement for change in colour due to UV exposure has been specified in addition to the colour fastness to light. To ensure the appearance retention of pile yarn in artificial grass carpet, the assessment of change in appearance is of significant important. Accordingly, changes in appearance by means of hexapod tumbler test has also been specified.

Apart from above the requirement of flame retardancy by means of tablet test has also been specified to meet fire safety requirement from fire accidents during the application of carpet.

The composition of the committee responsible for formulation of this standard is listed in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

TEXTILE FLOOR COVERING — ARTIFICIAL GRASS CARPET MADE OF SYNTHETIC YARN FOR LANDSCAPE — SPECIFICATION

1 SCOPE

1.1 This standard specifies the constructional particulars and performance requirements of tufted artificial grass made from polypropylene fibrillated yarn, polyethylene monofilament yarn or combination of both.

1.2 This standard does not specify the general appearance, design, size, etc. of artificial grass.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply:

3.1 Carpet — A carpet is a textile floor covering typically consisting of an upper layer of pile attached to a backing.

3.2 Artificial Grass Carpet — Artificial grass is a surface of synthetic fibers made to look like natural grass. It is most often used in residential lawns, outdoor places and commercial applications.

3.3 Pile/Tuft — It is a part of a textile floor covering consisting of textile yarns or fibres, cut or looped, projecting from the substrate and acting as a use surface.

3.4 Back-coating — The application of polymer material, for example high rubber-content latex, or

hot-melt resin compound, on the back side of primary backing containing tufts in a single operation to impart strength, tuft bind and dimensional stability to a carpet.

3.5 Primary Backing — The support fabric or base fabric material that acts as a carrier for the pile yarn and which is often additionally used as an anchor for other parts of the substrate.

3.6 Tuft Withdrawal Force — The tuft withdrawal force is the measure of force required to withdraw a single tuft or loop of pile from a carpet. It measures the binding force between carpet pile and backing.

4 MANUFACTURE

4.1 Pile Yarn

The yarn used in the manufacture of pile or tufts of artificial grass shall be made from the polypropylene fibrillated yarn, or polyethylene monofilament yarn or both together (*see Fig. 1*).

4.2 Primary Backing

Primary backing cloth used as a medium for tufting the pile yarn shall be synthetic woven or non-woven primary backing or backing woven with fleece or any other suitable backing cloth.

4.3 Backcoating

The carpet after tufting shall be coated with styrene butadiene latex or polyurethane latex. The minimum application of latex shall be 750 gsm.

4.4 Hole Punch

Perforations or holes shall be punched in horizontal and vertical direction into the backing of artificial grass carpet during manufacturing process to facilitate drainage of rain water or sprinkled water. The maximum distance between two holes shall not exceed 14 cm in both the directions.

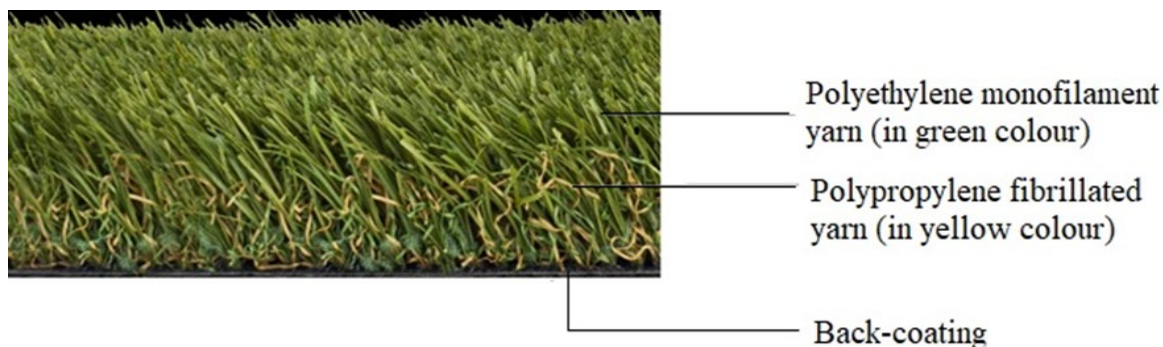


FIG.1 ARTIFICIAL GRASS CARPET

5 REQUIREMENTS

The artificial grass carpet shall conform to the requirements as specified in Table 1.

Table 1 Requirements for Artificial Grass Carpet
(Clause 5)

SI No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Length and width, m	As agreed with a tolerance of ± 1 percent	IS 17475
ii)	Pile thickness, mm, <i>Min</i>	25	Annex B of IS 5884
iii)	Pile weight, g/m ² , <i>Min</i>	800	IS 17657
iv)	Total mass per unit area, g/m ² , <i>Min</i>	1 650	IS 17657
v)	Water infiltration rate, mm/hr, <i>Min</i>	1 524	Annex B
vi)	Tuft withdrawal force, N, <i>Min</i>	45	IS 16201
vii)	Colour fastness to light, change in colour	4 or better	IS/ISO 105-B02
viii)	Colour fastness to shampooing, change in colour	4 or better	IS 11969
ix)	Colour fastness to water: a) Change in colour b) Staining	4 or better 4 or better	IS/ISO 105-E01
x)	Changes in appearance (Hexapod method), colour change after 4 000 cycles	3 or better	IS 17260
xi)	Dimensional change due to effect of varied water and heat, percent, <i>Max</i>	± 0.5	IS 11471
xii)	Flammability	Melt portion < 2.54 cm for 7 specimens out of 8	IS 12722
xiii)	Exposure to fluorescent UV lamp (3 000 h), change in colour	3 or better	Method A of IS 17863 (Part 3)

7 MARKING

7.1 A white paper sticker of appropriate size with the following information shall be securely attached or fixed on to sides of the carpet roll:

- Name of the product;
- Manufacturer's name, initials or trademark;
- Pile yarn type for example PP fibrillated or PE monofilament;
- Pile thickness;
- Pile weight;
- Total mass per unit area;
- Length and width of roll (m);

- Batch No. or Lot No.;
- Month and year of manufacture; and
- Any other statutory requirement as required by the law in force or as agreed between buyer and purchaser.

7.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

8 PACKING

The artificial grass carpet shall be packed securely so as to allow normal handling and transport without tearing and exposing the contents. The artificial grass carpet shall be packed in roll form with pile side rolled inside and coating on back side which is visible from outside. Details of packing shall be as agreed to between the buyer and seller.

9 SAMPLING AND CRITERIA FOR CONFORMITY

9.1 Lot

All the carpet having same dimensions, composition,

pile gsm and pile thickness delivered to a buyer against a dispatch note shall constitute a lot.

9.2 The conformity of the lot to the various requirements specified in the standard shall be determined on the basis of tests carried out on the sample selected from the lot.

9.3 Unless otherwise agreed to between the buyer and the seller, the carpets to be selected at random shall be as given in Table 2.

Table 2 Sample Size and Permissible Number of Non-conforming Carpets
(Clause 9.3 and 9.4)

Sl No.	Lot Size	Sample Size	Permissible Number of Non-Conforming Carpets	Sub-Sample Size
(1)	(2)	(3)	(4)	(5)
i)	Up to 90	5	0	3
ii)	91 to 150	8	0	3
iii)	151 to 500	13	1	5
iv)	501 to 1200	20	1	5
v)	1 201 to 10 000	32	2	8
vi)	10 001 to 35 000	50	3	8
vii)	35 001 to 500 000	80	5	13
viii)	500 001 and above	125	7	13

9.3.1 For selection of samples at random from the lot, procedure given in IS 4905 may be followed.

conformity for determining conformity of the lot requirements specified in this standard shall be as under:

9.4 Number of Samples and Criteria for Conformity

The number of carpets in the sample and criteria for

Sl No.	Characteristics	Number of Samples	Criteria for Conformity
i)	Length, width, pile thickness	According to col 2 of Table 2	Number of non-conforming pieces shall not exceed the corresponding number given in column 3 of Table 2
ii)	Pile weight, total mass per unit area, colour fastness, tuft withdrawal force, change in appearance, dimensional change due to effect of varied water and heat, water permeability	According to col 4 of Table 2	All the test pieces shall meet the requirement.
iii)	Flammability, exposure to fluorescent UV lamp		The test shall be carried out once in a year for the product.

ANNEX A
(Clause 2)

LIST OF REFERRED STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
IS 6359 : 1971	Method for conditioning of textiles	IS 17260 : 2019/ ISO 10361 : 2015	Textile floor coverings — Production of changes in appearance by means of vettermann drum and hexapod tumbler tester
IS 7877 (Part 1 to 5) : 1976	Methods of sampling and tests for hand-made carpets	IS 17657 : 2021/ ISO 8543 : 2020	Textile floor coverings — Methods for determination of mass
IS 11205 : 2011	Textile floor coverings — Vocabulary (<i>first revision</i>)	IS 17475 : 2020/ ISO 24341 : 2006	Resilient and textile floor coverings — Determination of length, width and straightness of sheet
IS 12722 : 1989	Flammability test to carpets and rugs	IS 17863 (Part 3) : 2022/ISO 4892-3 : 2016	Plastics methods of exposure to laboratory light sources: Part 3 Fluorescent UV lamps
IS 4905 : 2015 ISO 24155 : 2009	Random sampling and randomization procedures (<i>first revision</i>)	IS/ISO 105-A02 : 1993	Textiles — Tests for colour fastness: Part A02 Grey scale for assessing change in colour
IS 11471 : 2020/ ISO 2551 : 2020	Textile floor coverings and textile floor coverings in tile form — Determination of dimensional changes due to the effects of varied water and heat conditions and distortion out of plane	IS/ISO 105-B02 : 2014	Textiles — Tests for colour fastness: Part B02 Colour fastness to artificial light: Xenon arc fading lamp test
IS 11969 : 2020/ ISO 18168 : 2015	Textile floor coverings — Colour fastness to shampooing (<i>first revision</i>)	IS/ISO 105-E01 : 2010	Textiles — Tests for colour fastness: Part E01 Colour fastness to water
IS 16201 : 2014/ ISO 4919 : 2012	Determination of tuft withdrawal force		

ANNEX B
[Table 1, Sl No. v)]

WATER PERMEABILITY TEST

B-1 OBJECTIVE

To determine the water permeability of artificial grass carpet for landscape.

B-2 APPARATUS

Large cylinder, double ring infiltrometer, scale, clock, sealing material (silicon rubber), water supply, heavy weights for sealing (if necessary).

B-3 CONDITIONING

Sample received for testing shall be conditioned at standard atmospheric condition i.e at relative humidity (65 ± 2) percent and temperature (27 ± 2) °C.

B-4 PROCEDURE

B-4.1 Cut the specimen of size 1 000 mm × 1 000 mm.

B-4.2 Select specimen from a region so that infiltrometer is positioned with the minimum number of drainage holes possible within the two rings.

B-4.3 Seal the cylinders onto the surface with silicone rubber taking care to ensure that it does not restrict water infiltration from any of the area enclosed by the inner cylinder. Apply weights (if necessary).

B-4.4 Pond water in both cylinders until the flow of water into the inner cylinder is constant and the water level approaches a steady-state value. Ensure that the water level in the outer cylinder is within ± 2 mm of the level in the inner cylinder.

B-4.5 Measure the time (t_A) for the water to fall by 20 mm from an initial ponding depth of (30 ± 1) mm to a final ponding depth of (10 ± 1) mm, or the fall in the water level (F_{WA}) after a minimum of 30 min, whichever is quicker.

B-4.6 Calculate the water infiltration rate I_A , in mm/h, from the following formula:

$$I_A = \frac{F_{WA}}{t_A}$$

where

F_{WA} = the fall of water level (mm);

t_A = time taken for the water level to fall in hour (h).

B-5 REPORT

B-5.1 Compare the results against standard specifications.

ANNEX C
(Foreword)

COMMITTEE COMPOSITION

Wool, Wool Products and Textile Floor Coverings Sectional Committee, TXD 04

<i>Organization</i>	<i>Representative(s)</i>
ICAR - Central Sheep & Wool Research Institute, Avikanagar	DR D. B. SHAKYAWAR (Chairperson)
Agnext Technologies Pvt Limited, Mohali	SHRI TARANJEET SINGH BHAMARA SHRI SALIL LAKHANPAL (<i>Alternate</i>)
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Carpet Export Promotion Council, New Delhi	SHRI SANJAY KUMAR SHRI SUBODH KUMAR GUPTA (<i>Alternate</i>)
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Obeetee Pvt Limited, Bhadohi	SHRI MAKARAND MEHANDALE SHRI VIRENDRA KUMAR SHARMA (<i>Alternate</i>)

<i>Organization</i>	<i>Representative(s)</i>
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TAHFUZ Society, Srinagar	SHRI RAUF WADERA SHRI MOHAMMAD RAFIQ SOFI (<i>Alternate</i>)
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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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